

REMARKS

Claims 1, 30, 49, and 52 have been amended. Claims 12, 33, 54, 58, 59, and 60 have been amended for consistency and for clarification purposes. Claims 1-23, 25-71, and 73-77 are currently pending. Applicant reserves the right to pursue the original claims and other claims in this and other applications.

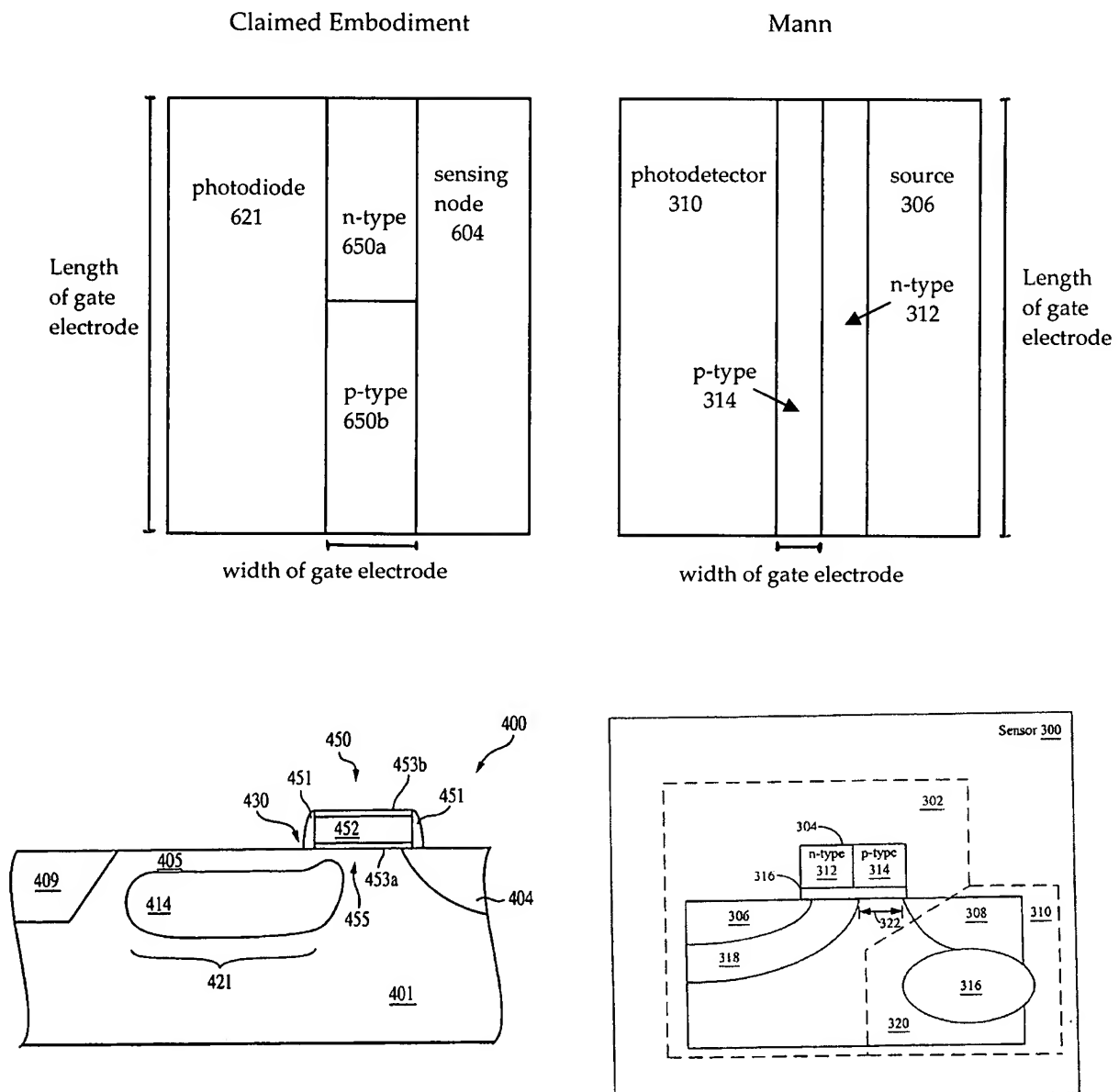
Claims 1, 8-11, 30-32, 39-41, 52, and 59-62 stand rejected under 35 U.S.C. § 102(e) as being unpatentable over U.S. Patent No. 6,768,149 ("Mann"). This rejection is respectfully traversed.

Applicant respectfully submits that Mann fails to disclose, teach or suggest a transistor comprising "a gate electrode having a length and a width, . . . said length of said gate electrode being divided into a plurality of gate electrode regions, wherein at least one said gate electrode region has a work-function greater than a work-function of n+ Si, and another said gate electrode region has a different work-function from that of said at least one gate electrode region" as recited in claims 1, 30, and 52. The width of the gate electrode is further claimed as "extending from said photo-conversion device to said sensing node." *See, e.g.*, Specification at FIGs. 6A and 7A.

The *length* of the gate electrode in Mann, however, is *not* divided into a plurality of gate electrode regions. In fact, if the width of Mann's gate electrode is 322 as the Advisory Action suggests, Mann discloses a *single* p-type gate electrode region 314. *See* Mann at FIG. 3.

This difference is easily seen in the top plan and side sectional views of an embodiment of the claimed invention and Mann's device illustrated below. The top plan

and side sectional views of an embodiment of the claimed invention are a reproduction of a portion of FIG. 6A and a reproduction of FIG. 4 in the specification, respectively. The top plan view of Mann's device is based on FIG. 3 of Mann and the corresponding side sectional view is a reproduction of the same figure (i.e., FIG. 3).



Here, the claimed gate electrode regions 650a, 650b having different work-functions each extend the defined width of the gate electrode and divides the length of the gate electrode into a plurality of gate electrode regions, as recited in claims 1, 30, and 52. *See also* specification at ¶¶ 0064 and 0068. The length of Mann's gate electrode, however, is not divided into a plurality of gate electrode regions. In fact, not even the width of Mann's gate electrode is divided into a plurality of gate electrode regions, if the width is 322 as the advisory action suggests. For at least these reasons, claims 1, 30, and 52 are patentable over Mann.

Claims 8-11 depend from claim 1 and are allowable along with claim 1. Claims 31, 32, 39-41 depend from claim 30 and are allowable along with claim 30. Claims 59-62 depend from claim 52 and are allowable along with claim 52. For at least the reasons stated above, Applicant respectfully requests the withdrawal of the rejection and allowance of the claims.

Claims 2, 7, 12-13, 33, 38, 53, and 58 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Mann. This rejection is respectfully traversed.

As discussed above, Mann fails to disclose, teach or suggest all the limitations of claims 1, 30, and 52. For at least the same reasons that Mann does not anticipate claims 1, 30, and 52, Mann does not render claims 1, 30, and 52 obvious.

Claims 2, 7, 12, and 13 depend from claim 1 and are allowable along with claim 1. Claims 33 and 38 depend from claim 30 and are allowable along with claim 30. Claims 53 and 58 depend from claim 52 and are allowable along with claim 52. Accordingly,

Applicant respectfully requests the withdrawal of the rejection and allowance of the claims.

Claims 3-6, 34-37, and 54-57 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Mann in view of Ponomarev (Gate-Work-Function Engineering Using Poly-(Si, Ge) for High-Performance 0.18 μ m CMOS technology, IEDM 1997). This rejection is respectfully traversed.

As discussed above, Mann fails to disclose, teach or suggest all the limitations of claims 1, 30 and 52. Ponomarev is cited for teaching a gate comprising a mid-gap material including SiGe. Ponomarev, however, fails to cure the deficiencies of Mann. Therefore, even when considered in combination, the cited references fail to teach or suggest all the limitations of claims 1, 30 and 52.

Claims 3-6 depend from claim 1 and are allowable along with claim 1. Claims 34-37 depend from claim 30 and are allowable along with claim 30. Claims 54-57 depend from claim 52 and are allowable along with claim 52. Accordingly, Applicant respectfully requests the withdrawal of the rejection and allowance of the claims.

Claims 49-51 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Mann in view of U.S. Patent No. 6,198,087 ("Boon"). This rejection is respectfully traversed.

Claim 49 recites a processor system comprising a pixel. The pixel of claim 49, in turn, comprises "a gate electrode having a length and a width, . . . said length of said gate electrode being divided into two gate electrode regions, wherein one said gate electrode region has a work-function greater than a work-function of n+ Si, and another said gate


electrode region has a different work-function from that of said one gate electrode region.” The width of the gate electrode is further claimed as “extending from said photo-conversion device to said sensing node.” Mann fails to disclose, teach or suggest these limitations of claim 49 for the similar reasons as claims 1, 30, and 52 stated above. Boon, which has been cited for teaching a processor and an image sensor coupled to the processor, fails to cure the deficiencies of Mann. Therefore, even when considered in combination, the cited references fail to teach or suggest all the limitations of claim 49.

Claims 50 and 51 depend from claim 49 and are allowable along with claim 49. Accordingly, Applicant respectfully requests the withdrawal of the rejection and allowance of the claims.

In view of the above, Applicant believes the pending application is in condition for allowance.

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Respectfully submitted,

By  #41,198

Thomas J. D'Amico

Registration No. 28,371

Gianni Minutoli

Registration No. 41,198

DICKSTEIN SHAPIRO LLP

1825 Eye Street, NW

Washington, DC 20006-5403

(202) 420-2200

Attorneys for Applicant